Subject Index

Absarokite 34ff.
actinolite 282
activity–composition relations, olivine and orthopyroxene solid solutions 57f.
albite 314f.
alkali feldspar 87f., 322
–, Ba partitioning 330
alkaline basalts 18f.
alkali olivine basalt 35f.
almandine 478
amphibole 225, 442
amphibolite 473
–, experim. melting 281ff.
andalusite 6, 185
andesine 450
andesite 94, 463
andesite porphyry 437
ankerite 482
annite 482
anorthite, CMAS system 406ff.
–, liquidus phase relations 80ff.
anorthosite 140
apatite 174, 191
–, indicator of magma evolution 138ff.
$^{40}Ar/^{39}Ar$ chronology, igneous complexes 127ff.
assemblage diagram, metamorphism 73
assimilation 263, 450
–, granitoids 470
augite 455

B, Yellowstone pegmatites 176f.
banakite 35
Ba partitioning, alkali feldspar/melt 328ff.
basalt flows 433f.
basaltic andesite 267
basalts 455f.
–, Iceland 18f.
–, Japan 34f.
–, Kuriles 267f.
Be, Yellowstone pegmatites 176f.
benmoreite 433
beryl 183
biotite 141, 174, 179, 191, 225, 478
B mineralization, metamorphism 281ff.
bronzite 140

Calcite 163ff.
Ca partitioning, olivine/melt 255
carbonatites 337f.
chamosite 478
chemical analysis
–, absarokite, Japan 35
–, almandine 480
–, amphiboles, Mt. Brome 129
–, –, xenoliths 442
–, apatite, Stillwater cumulates 140
–, basalts, Iceland 19
–, –, Japan 35
–, –, Kuriles 272
–, beryl, Sparrow pegmatite 183
–, biotite 480
–, –, hornfels 197
–, –, Mt. Brome 129
–, –, Sparrow granite 179
–, clinopyroxene, absarokite 36
–, –, Finero 424
–, –, xenoliths 236, 441
–, danburite 286
–, enstatite, xenoliths 235
–, feldspars, harzburgites 237
–, –, macusanite crystallization 4
–, –, xenoliths 438
–, Fe-Ti oxides, Skaergaard gabbro 381
–, –, xenoliths 443
–, garnet, Finero 424
–, –, Münchberg eclogites 223
–, granite, Sparrow lake 177
–, granitoid minerals, Absaroka 464f.
–, grunerite 480
–, harzburgite, Merelava 231
–, hornblende 287
–, –, absarokite 37
–, hornfels, Yellowknife 186
–, K-feldspar, hornfels 197
–, –, Sparrow lake granite 179
–, kyanite, Münchberg eclogite 222
–, ludwigite 286
–, macusanite 1
–, melt glasses, macusanite 7
–, micas, macusanite crystallization 6
–, MORB tholeiites 114
–, muscovite, hornfels 197
–, –, Münchberg eclogite 224
–, –, Sparrow lake granite 179
–, olivine, absarokite 36
–, –, phenocrysts, basalts 270
–, –, xenoliths 444
–, omphacite, Münchberg eclogite 223
–, orthopyroxene, Finero 424
–, pegmatites 2
–, –, Sparrow lake 177, 182
–, –, Yellowknife 196
–, peridotite 259
–, phlogopite, absarokite 37
–, plagioclase, Finero 424
–, –, hornfels 197
–, –, phenocrysts, basalts 270
–, –, Sparrow lake granite 179
–, –, Tanco pegmatite 290
–, pyroxene phenocrysts, basalt 269
–, sapphirine, Finero 424
–, spinel, absarokite
–, –, phenocrysts, basalt 270
–, –, xenoliths 236, 424
–, spodumene, pegmatites 183
–, stilpnomelane 480
–, tonalite 259
–, tourmaline 285
–, –, hornfels 197
–, –, Sparrow lake pegmatite 180
–, vishnevite 286
–, wehrlite, Merelava 231
–, xenoliths, O'Leary 430
–, –, Vanuatu lavas 231
–, zoisite, Münchberg eclogite 224
chlorite 225, 478
chromite 140, 268
Cl, apatites of layered intrusions 142f.
clinopyroxene 351., 94, 222, 268, 289, 439, 455
–, CMAS system 406ff.
–, xenoliths 234f.
clinozoisite 225
CO_2, granulite petrogenesis 321ff.
convective dissolution 510
crustal hydrology 348f.
crystal dissolution 492f.
crystallization fabrics, macusanite 10
cumulates 379f.
–, Stillwater Complex 140f.

Dacite 35, 433
danburite 282f.
dehydration, metamorphism 347ff.
diapirism, lithosphere 239
diffusion, crystal dissolution 492ff.
dikes 27f.
diopside 422
–, CMAS system 406ff.
–, transformation to garnet 389ff.
diorite 214
dislocation creep, olivine 103
dolerite 298ff., 455f.
dolomite 163ff.
dorrite 424

Eclogites, P–T evolution and fluid inclusions 221ff.
enstatite 235, 406
–, thermodynamic properties 51
–, transformation to garnet 389ff.
enthalpy effect, metamorphism 363
exsolution conditions, albite/oligoclase 316f.

F, apatites of layered intrusions 142f.
fayalite, thermodynamic properties 51
feldspars, macusanite melting and crystallization 2ff.
Fe–Mg exchange data, olivine/orthopyroxene 64f.
Fe–Mg ordering, olivine 242f.
ferrosilite 43
–, thermodynamic properties 51
Fe-silicates, phase relations 485ff.
fluid channelling, metamorphism 356
fluid inclusions, eclogites 226f.
–, metamorphic quartz 247f.
–, olivine 102f.
fluid phase composition, granulites 321ff.
fluids, metamorphic 321f., 348ff.
forsterite 163ff.
–, CMAS system 406ff.
–, thermodynamic properties 51
foyaite 127
fractional crystallization, cumulates 146f.
–, granitoids 470
–, Kuriles basalts 273f.
–, San Franzisco volcanics 449f.
–, vapor-undersaturated 1ff.

fractionation model, MORB trace elements 155f.

Gabbro 129, 377, 385f.
–, mid-ocean ridges 154ff.
–, O isotopes 25f.
gabbro norite 140
garnet 222
–, transformation from pyroxenes 389ff.
geothermobarometry, mantle xenoliths 368ff.
geothermometry, Skaergaard gabbro 385f.
–, ultramafic xenoliths 238f.
glass, fractional crystallization 2ff.
glide twinning, peristerite 306ff., 313ff.
granite 174ff., 214
granitoids, source regions 472
–, trace elements 462ff.
granulites 422, 438
–, fluid inclusions and phase equilibria 321ff.
greenalite 478
grossular, transformation from pyroxenes 394ff.
grunerite 478

Halite, inclusion in quartz 249
halogen fugacity variations, igneous rocks 138ff.
haplogranite system, solidus temperatures, influence of fluid phase composition 321ff.
harzburgite 231f.
hawaiite 433
heat budget, metamorphism 357f.
hornblende 35, 282, 307, 422, 478
hornfels 140
hybridization, subduction-zone magmas 282
hydrothermal alteration, sub-seafloor 93ff.

Ijolite 336
Ilmenite 381
inflection, mantle geotherm 368ff.
intercumulus apatites, halogen fugacity variations 138ff.
interdiffusion, plagioclase 317
interface reaction, crystal dissolution 492ff.
iron formations, metamorphic Precambrian, stilpnomelane stability 478ff.
island arc lavas 230f.
island arc volcanism 265ff.

Jadeite, transformation to garnet 389f.

Kalsilite 87f.
K-feldspar 1ff., 174, 179
kimberlites, xenolith geothermobarometry 370ff.
kyanite 185, 222
kyanite eclogite, P-T evolution 221ff.

Labradorite 450
latite 455
lavas, San Franzisco Field 429ff.
–, xenoliths 231f.
layered intrusions, magma evolution 138ff.
leucite 87f.
leucitite 89
lherzolite 34, 231
Li, Yellowknife pegmatites 174f., 179
LIL elements, Kuriles basalts 273
liquidus phase relationships, systems Q–An–Ne–Ks/ternary feldspars 78ff.
ludwigite 282f.

Macusanite, fractional crystallization 1ff.
magma trapping, cumulate phases 154ff.
magma mixing 429ff.
magnetite 268, 381, 479
mantle pyroxenes, composition 389
mantle xenoliths 389f.
mass balance, geochemical, MORB tholeiites 117f.
–, metasomatism 192f.
mass-transfer, ophiolite alteration 93ff.
matrix analysis, metamorphic mineral assemblages 69ff.
melilite 406
melt differentiation, macusanite 8f.
melt formation, granulite facies 325
melt-H_2O solubilities 1f.
melting, crustal rocks 321f.
melting phase relations, absarokite 37f.
melt structure, CMAS system 406ff.
–, macusanite 10
metamorphic mineral assemblages 69ff.
metamorphism, fluid and enthalpy production 347ff.
–, thermal, fluid inclusion data 247f.
mica 6
migration, metasomatism 202
minnesotaite 479
mixing model, trace elements in MORB 155ff.
mixing properties, olivine-orthopyroxene solid solutions 41ff.
molar Gibbs energy of mixing, olivine-opx 43ff.
monticellite 406
monzodiorite 127f.
MORB tholeiites, sub-type petrogenesis 112ff.
mugearite 433
muscovite 174, 179f., 222
–, metasomatic crystallization 191ff.

Nd isotopic composition, granitoids 469
nepheline 87f.
nepheline diorite 129
nephelinite, peralkaline 336ff.
–, –, crystallization 342
nordmarkite 127
norite 142

Obsidian 433
O fugacities Skaergaard layered intrusion 376ff.
O isotope exchange, gabbros 29f.
O isotopic ratios, Etendeka basalts 456f.
oligoclase 314f.
olivine 35, 72, 94, 139f., 233, 268, 410, 444
–, fluid inclusions re-equilibration 102ff.
olivine-orthopyroxene solid solutions, thermodynamics 41ff., 49
olivine tholeiite 231
omphacite 222
ophiolites, alteration 93ff.
–, geochronology 207ff.
orthopyroxene 72, 234, 268, 372, 424, 439
orthopyroxene-olivine solid solutions, thermodynamics 41ff.
orthopyroxenite 140

Paragonite 225
pargasite 424
partial melting, absarokite petrogenesis 40
–, granitoid origin 474f.
–, mafic rocks 281ff.
Pb isotopic composition, granitoids 468
pegmatite dike, contact metasomatism 191ff.
pegmatites 174ff.
–, differentiation 1ff.
peralkalinity, igneous rocks 330ff.
peridotite 140
peridotite xenoliths, P–T arrays 370f.
peristerite, glide twinning 306ff., 313ff.
perowskite ijolite 340
phase-saturation constraints, MORB trace elements 158f.
phenocrysts, Kurile basalts 268f.
phlogopite 35
phonolites 89
pigeonite 455
pillow lavas 19
plagioclase 9f., 80ff., 94, 140, 174, 179, 191, 237, 267f., 282, 423f., 439, 455
–, glide twinning 306ff., 313ff.
plagioclase cumulate 139
plagioclase lherzolite 119
plagiogranite 214
platinum group elements, ultramafitites 150f.
porosity, metamorphic 350f., 364
pseudobrookite 381
pulaskite 127
pyrolite 231
pyrope, transformation from enstatite 394ff.
pyroxenes, high-pressure stability 389ff.

Quartz 43, 72, 174, 179, 191, 282, 323, 479
quartz-feldspar intergrowths, experimental 1ff.
quartz keratophyre 214
quartz latite 455
quartz tholeiite sill 298f.

Rb/Sr geochronology, ophiolites 211
reaction enthalpy, influence on metamorphic temperatures 354ff.
Redlich-Kwong equation of state 107
REE, Kurile basalts 274f.
regression modelling, metamorphic reactions 70f.
rhönite 424
rhyodacite 433
rhyolite 1, 433f., 451
rhyolite sill 463f.
ripidolite 478

Sanidine 237
sapphirine, coex. with clinopyroxene 422ff.
schorl 282f.
serendibite 424
shoshonite 35
siderite 479
silica transport, fluid infiltration 361
siliceous dolomites, assemblages 163f.
sillimanite 185
S isotopes, Iceland volcanics 18ff.
Sm/Nd geochronology, ophiolites 211
solid solutions, CMAS system 406ff.
solidus temperatures, haplogranite system 323ff.
spinel 270, 406, 424
spinel lherzolite 119
spodumene 183
Sr isotopic ratios, Antarctic tholeiites 303
–, granitoids 469
stilpnomelane, stability 478ff.
stishovite 390
subduction zone magmatism, hybridization 257f.
sub-seafloor alteration, ophiolites 93f.
sylvite, inclusion in quartz 249
symplectites, Finero 424

Tectonites 231
tephra, island arcs 230f.
thermodynamic properties, Fe minerals 483
thermodynamics, system Mg_2SiO_4 – Fe_2SiO_4 – SiO_2 41ff.
tholeiites 18f.
–, Antarctica 296ff.
tinguaite 127
tonalite/peridotite/H_2O, high pressure 257f.
–, liquidus phase diagram at 30 kb 261
tourmaline 179
–, metasomatic crystallization 191ff.
–, stability in mafic metamorphic systems 281ff.
tourmaline stability, pH dependence 291
tourmalinization, amphibolites 293f.
trace element partitioning, olivine/melt 242f.
trace element, Antarctic tholeiites 301f.
–, granitoids 465ff.
–, Kuriles basalts 271f.
–, macusanite crystallization 8
–, MORB tholeiites 115f., 156
–, pegmatites 182f.
–, San Franzisco volcanics 447
–, Vanuatu lavas 231
trachyte 329
tremolite breakdown 326
tremolite + dolomite, reaction kinetics 163ff.
twinning, plagioclases 306ff., 313ff.

Ultramafic xenoliths, Vanuatu volcanics 230ff.
ulvöspinel 381
U/Pb geochronology, ophiolitic zircons 209
upper mantle geotherm 367ff.

Virgilite 1ff.
vishnevite 282
volcanism, San Franzisco Field 429ff.

Warwickite 282
water, metamorphism 347ff.
wehrlite 231f.
wollastonite 406

Xenoliths, mantle-geotherm determination 367f.
–, San Franzisco volcanics 429ff.

Zeolite 458
zircon age data, ophiolites 211f.
zoisite 222
zonation, feldspars 1f.
–, pegmatites 13
zone rifting, ultramafitites 147
zoning, eclogitic garnets 222
Zr - Sr relations, MORB 159f.
Zussmanite 482